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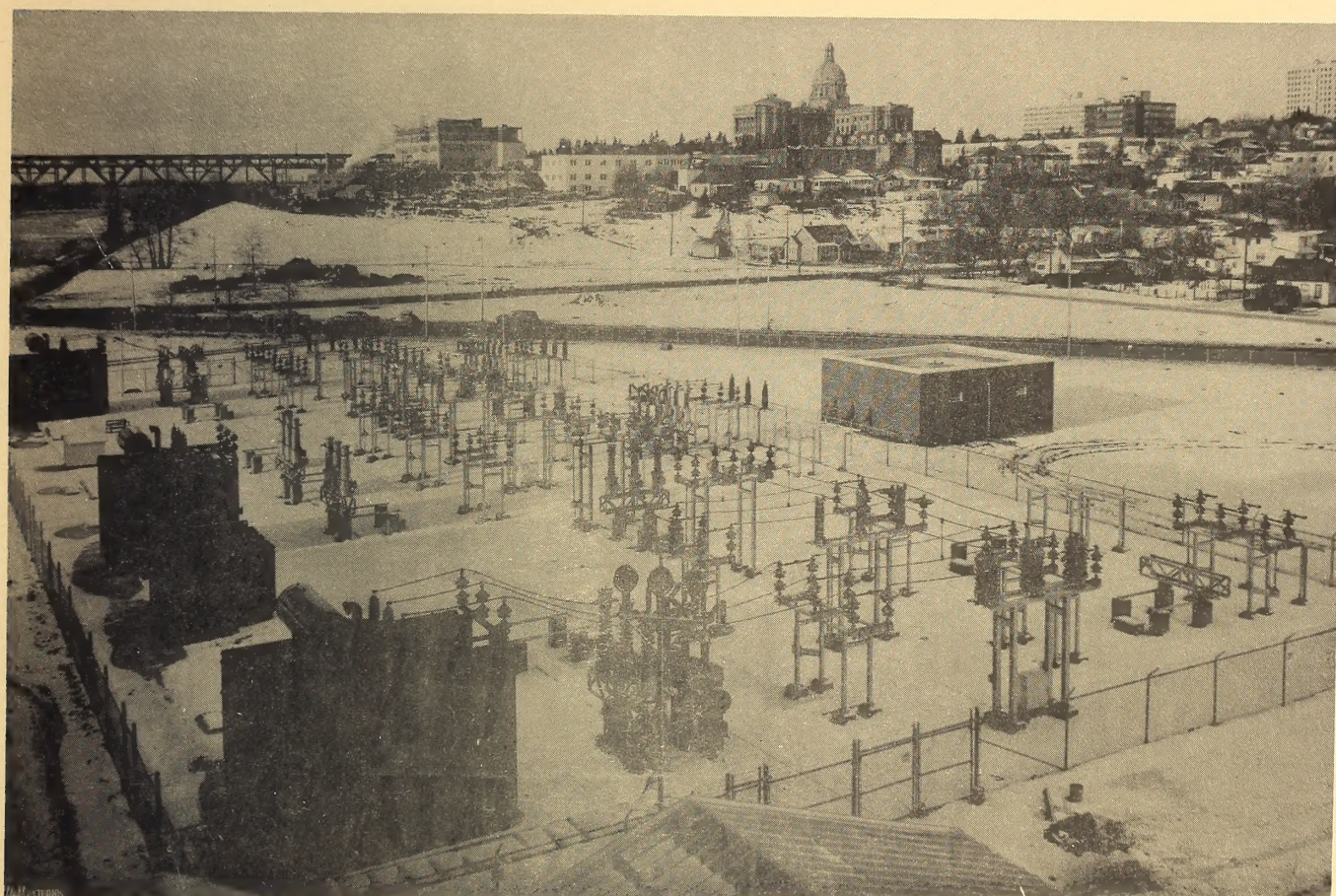
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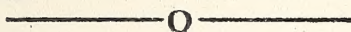


ANNUAL REPORT

1957



GOVERNMENT OF THE PROVINCE OF ALBERTA



ANNUAL REPORT

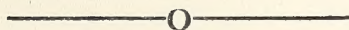
OF THE

ALBERTA POWER COMMISSION

FOR THE YEAR ENDING

DECEMBER 31, 1957

EDMONTON



J. G. MACGREGOR

CHAIRMAN

January 31st, 1958

The Honorable R. Reiersen,
Minister of Industries and Labour,
Administration Building,
Edmonton, Alberta.

Sir:

I have the honor to submit herewith the Annual Report of the Alberta Power Commission for the calendar year ended December 31st, 1957.

An audited statement of receipts and disbursements of the Alberta Power Commission will be sent under separate cover.

Respectfully submitted,

ALBERTA POWER COMMISSION

J. G. MacGregor,
Chairman.

ALBERTA POWER COMMISSION


1 9 5 7

J. G. MacGregor,
Chairman

W. C. Whittaker,
Member

J. E. Oberholtzer,
Member

J. L. Reid,
Member and Secretary



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"Cascade Plant of Calgary Power Ltd. showing second penstock needed to double capacity."

Courtesy Alpine Films

ALBERTA POWER COMMISSION

ANNUAL REPORT

For Year Ending December 31st, 1957.

The Alberta Power Commission is not an operating Commission; that is, it does not own or operate any power plants, transmission lines or distribution systems. In this respect it is different from the Power Commissions in all the other Provinces, except Prince Edward Island and Newfoundland. Keeping this in mind, it might be well to consider the duties and the responsibilities of the Power Commission. Its duties at present, under the Power Commission Act, are only those of a regulatory or supervisory nature. These duties are largely covered by Section 6 of the Power Commission Act, which is as follows:

"Whenever required so to do by the Lieutenant Governor in Council the Commission shall inquire into, examine and investigate, -

- (a) water powers and water privileges in Alberta, their value and capacity;
- (b) the existing facilities for the manufacture and distribution of power in Alberta;
- (c) such other matters relating to power and its distribution in Alberta as the Lieutenant Governor in Council from time to time may require;

and shall report thereon to the Lieutenant Governor in Council."

The Commission feels that its principal duties at the present time are threefold:

1. The collection of statistics of the Central Station Industry in the Province, and the study of these statistics so that the people of the Province will have a true picture of the industry.

2. The study of hydro-electric sites and other power possibilities in the Province. During the past year there have been no direct studies of specific hydro-electric sites. The Commission, however, has been engaged in a study of the existing network of transmission lines in the Province with particular reference to more extensive interconnection which will ensure the most efficient use of the large generating units which are already in operation and of those anticipated in the future.
3. Farm Electrification. This is the phase of its work to which the Commission has devoted most of its time. As the number of electrified farms increases the problems of farm electrification become more complicated. The Commission has devoted a great deal of effort towards making farm electrification available in some of the more remote areas of the Province. Many surveys have been made of farming areas and more will be carried out during the next year. The question of saturation of farm electrification has been studied and is discussed later in the report.

During the year the Commission suffered a great loss in the death of Mr. W. J. Dick, who had been a member for some seven years. His wide knowledge of the affairs of the Province and his long association with its industrial life made his advice particularly valuable.

Towards the end of the year Mr. W. C. Whittaker was appointed to the Commission. He, too, has had great experience in the industrial activity of the Province and is an outstanding mining engineer. In view of the importance which the Commission attaches to our tremendous energy reserve in the form of the immense coal beds in the Province, Mr. Whittaker's acceptance of this appointment is most gratifying.

The pace of Alberta's industrial expansion has slowed somewhat due particularly to the decreased markets for oil. In spite of this the increase

in K.W.H. generated has been 11% over that of a year ago. The expansion of the need for electricity in the Province is expected to continue at a relatively high rate but for a year or so at least will not climb as it has done in the previous few years.

Tables No. 1 to 8, which follow, show this expansion in statistical form:

Table No. 1 shows the capacity in M.W. of the Central Electric Stations in Canada for the past ten years.

TABLE NO. 1

Capacity of Central Electric Stations

<u>Year</u>	<u>Alberta</u>	<u>M.W.</u> <u>Canada</u>	<u>Saskatchewan</u>	<u>Manitoba</u>
1946	148	7,332	127	399
1947	158	7,165	** 197	** 332
1948	165	7,491	218	350
1949	207	7,939	232	350
1950	208	8,734	234	445
1951	280	9,724	272	457
1952	288	10,613	322	542
1953	372	11,687	347	561
1954	405	12,479	356	561
1955	477	13,422	394	637
1956	* 572	14,376	415	637
1957	* 596			

* Figures marked thus are Alberta Power Commission figures, the others are converted to M.W. from figures given in H.P. by the Dominion Bureau of Statistics.

** One station formerly counted in Manitoba transferred to Saskatchewan.

Increase during the 10 year period ended 1956

<u>Year</u>	<u>Alberta</u>	<u>Canada</u>	<u>***Saskatchewan</u>	<u>***Manitoba</u>
1956	572	14,376	415	637
1946	148	7,332	194	332
	<hr/>	<hr/>	<hr/>	<hr/>
Increase:	424	7,044	221	305
Percent Increase:	286%	96%	114%	92%
Increase Alberta:	1947 to 1957 - 277%			

*** These figures for Saskatchewan and Manitoba have been corrected to take account of the fact that one station formerly counted as in Manitoba was transferred to Saskatchewan's total in 1947.

Table No. 2 shows the growth of K.W.H. generated net during the past ten years.

TABLE NO. 2
Electric Energy Generated by Central Electric Stations
(Millions of K.W.H.)

<u>Year</u>	<u>Alberta</u>	<u>Canada</u>	<u>Saskatchewan</u>	<u>Manitoba</u>
1946	602	41,736	271	2,389
1947	641	43,424	** 763	** 2,032
1948	724	42,390	805	2,056
1949	801	44,419	858	2,160
1950	869	48,494	903	2,449
1951	997	54,852	979	2,565
1952	1,174	59,409	1,079	2,699
1953	1,340	62,860	1,174	2,754
1954	1,498	65,936	1,292	3,011
1955	1,729	72,911	1,482	3,104
1956	* 2,019	78,004	1,551	3,334
1957	* 2,243			

* Figures marked thus are Alberta Power Commission figures, the others are from the Dominion Bureau of Statistics.

** One station formerly counted as in Manitoba now treated as being in Saskatchewan.

Increase during the 10 year period ended 1956

<u>Year</u>	<u>Alberta</u>	<u>Canada</u>	<u>***Saskatchewan</u>	<u>***Manitoba</u>
1956	2,019	78,004	1,551	3,334
1946	602	41,736	671	1,989
	<hr/>	<hr/>	<hr/>	<hr/>
Increase:	1,417	36,268	880	1,345
Percent Increase:	235%	87%	131%	68%
Increase Alberta:	1947 to 1957 - 250%.			

*** These figures for Saskatchewan and Manitoba have been corrected to take account of the fact that one station formerly counted as in Manitoba was transferred to Saskatchewan's total in 1947.

TABLE NO. 3

Annual K.W.H. used per Domestic Customer

<u>Year</u>	<u>Alberta</u>	<u>Canada</u>	<u>Saskatchewan</u>	<u>Manitoba</u>
1946	819	1,844	1,018	4,433
1947	882	1,951	1,034	4,304
1948	989	2,078	1,115	4,628
1949	1,073	2,168	1,199	4,694
1950	1,224	2,413	1,353	4,783
1951	1,384	2,617	1,531	4,813
1952	1,473	2,809	1,677	4,868
1953	1,624	3,008	1,878	4,960
1954	1,865	3,271	2,072	5,229
1955	1,975	3,500	2,483	5,420
1956	2,256	3,740	2,361	5,636

These are Dominion Bureau of Statistics figures.

Increase during the 10 year period ended 1956

<u>Year</u>	<u>Alberta</u>	<u>Canada</u>	<u>Saskatchewan</u>	<u>Manitoba</u>
1956	2,256	3,740	2,361	5,636
1946	819	1,844	1,018	4,433
	<hr/>	<hr/>	<hr/>	<hr/>
Increase:	1,437	1,896	1,343	1,203
Percent increase:	175%	103%	132%	27%

Manitoba has an exceptionally high figure for K.W.H. used per domestic customer. This is partly due to the fact that one city alone - Winnipeg - contains a large percentage of the total population of the province. It is also due to the fact that the cost of developing the water power sites adjacent to Winnipeg was possibly the cheapest in the world. This provided cheap power for the people of the City of Winnipeg, and since fuel was expensive there, electricity was used extensively for cooking and heating, and a happy combination of low rates produced high use, and vice versa.

The figures for Canada for K.W.H. used per year per domestic customer is high because it takes into account the high consumption in Manitoba, and in Ontario.

It will be noted also that Saskatchewan's consumption is higher than that in Alberta. This is largely due to the fact that all cities and towns in Alberta, and many of the smaller centers, use natural gas for cooking and water heating, whereas until recently gas has not been available in Saskatchewan, and the consumers there tend to use electricity for these purposes.

TABLE NO. 4

Costs in Cents per K.W.H. Domestic Customers Only

<u>Year</u>	<u>Alberta</u>	<u>Canada</u>	<u>Saskatchewan</u>	<u>Manitoba</u>
1946	4.18	1.62	4.29	1.02
1947	3.93	1.60	4.27	1.08
1948	3.72	1.60	4.09	1.06
1949	3.54	1.59	3.95	1.11
1950	3.28	1.61	3.80	1.15
1951	3.16	1.65	3.70	1.18
1952	3.06	1.65	3.59	1.21
1953	2.91	1.70	3.52	1.23
1954	2.75	1.69	3.39	1.25
1955	2.64	1.66	2.93	1.18
1956	2.51	1.64	3.17	1.15

These are Dominion Bureau of Statistics figures.

Decrease during the 10 year period ending 1956

<u>Year</u>	<u>Alberta</u>	<u>Canada</u>	<u>Saskatchewan</u>	<u>Manitoba</u>
1946	4.18	1.62	4.29	1.02
1956	2.51	1.64	3.17	1.15
	<hr/>	<hr/>	<hr/>	<hr/>
Decrease:	1.67	Increase: .02	1.12	Increase: .13
Percent Decrease:	40%	Increase: 1%	Decrease: 26%	Increase: 13%

TABLE NO. 5

Total Number of Customers of Central Electric Stations
(Thousands)

<u>Year</u>	<u>Alberta</u>	<u>Canada</u>	<u>Saskatchewan</u>	<u>Manitoba</u>
1946	121	2,477	90	131
1947	131	2,643	97	148
1948	142	2,822	106	151
1949	157	3,076	114	163
1950	172	3,270	121	179
1951	186	3,440	127	194
1952	200	3,621	139	209
1953	221	3,817	151	221
1954	239	4,002	170	234
1955	267	4,225	185	243
1956	276	4,426	206	254
1957	* 292			

Increase during the 10 year period ending 1956

<u>Year</u>	<u>Alberta</u>	<u>Canada</u>	<u>Saskatchewan</u>	<u>Manitoba</u>
1956	276	4,426	206	254
1946	121	2,477	90	131
	<hr/>	<hr/>	<hr/>	<hr/>
Increase:	155	1,949	116	123
Percent Increase:	128%	79%	129%	94%

TABLE NO. 6

Number of Farms Served by Central Electric Stations
as at December 31 each year

<u>Year</u>	<u>Alberta</u>	<u>Saskatchewan</u>	<u>Manitoba</u>
1947	2,275	739	2,496
1948	3,393	1,227	5,694
1949	5,017	2,299	11,155
1950	* 11,032	4,057	16,964
1951	* 13,479	5,594	23,777
1952	* 18,055	8,591	29,623
1953	* 24,181	13,850	33,601
1954	* 30,504	21,287	37,422
1955	* 34,768	31,619	38,277
1956	* 37,658	38,495	38,091
1957	* 41,130	* 47,000	
** Percentage:	59%	57%	86%

* Figures marked thus are Alberta Power Commission figures, and others are from the Dominion Bureau of Statistics.

** Percentage that is electrified of farms on which someone lived according to the 1956 Census.

TABLE NO. 7

Consumption in K.W.H. per Farm per Year

<u>Year</u>	<u>Alberta</u>	<u>Canada</u>	<u>Saskatchewan</u>	<u>Manitoba</u>
1946	1,752	1,558	940	1,077
1947	1,690	1,686	900	1,678
1948	1,883	1,711	860	1,940
1949	2,128	1,752	880	2,113
1950	2,250	1,932	880	2,359
1951	2,461	2,085	1,266	2,475
1952	2,747	2,228	1,527	2,666
1953	2,604	2,420	1,915	2,943
1954	2,958	2,672	2,053	3,541
1955	* 2,892	2,803	2,054	3,564
1956	* 3,040	3,060	2,217	3,911
1957	* 3,564			

TABLE NO. 8

Total Pole Line Mileage

(Includes transmission, distribution and rural lines)

<u>Year</u>	<u>Alberta</u>	<u>Canada</u>	<u>Saskatchewan</u>	<u>Manitoba</u>
1946	5,450	89,231	4,920	5,739
1947	6,271	98,530	4,353	8,262
1948	7,552	113,411	5,009	11,564
1949	10,103	135,329	5,371	16,785
1950	12,108	151,726	5,712	20,472
1951	15,125	170,582	9,574	24,439
1952	20,188	190,316	13,858	28,514
1953	26,211	213,176	20,899	32,237
1954	* 31,736	228,158	26,177	33,615
1955	* 36,233	243,773	33,755	33,219
1956	* 39,430	265,389	44,516	34,232
1957	* 43,404			

* Figures marked thus are Alberta Power Commission figures, the others are from the Dominion Bureau of Statistics.

TABLE NO. 9

K.W.H. Generated per Capita

<u>Year</u>	<u>Population</u>	<u>K.W.H. Generated x 10⁶</u>	<u>K.W.H. Generated/Capita</u>
1947	825,000	641	777
1948	854,000	724	848
1949	885,000	801	905
1950	913,000	869	952
1951	939,000	1,055	1,123
1952	970,000	1,213	1,250
1953	1,002,000	1,341	1,338
1954	1,039,000	1,499	1,443
1955	1,066,000	1,728	1,621
1956	1,123,000	2,019	1,798
1957	1,160,000	2,243	1,934



"Sturgeon Lake Gas Turbine plant of Canadian Utilities Limited
shown during construction."

Courtesy Canadian Utilities Limited.

PRESENT STATUS OF THE INDUSTRY

The Statistics for the Central Station Industry for the year 1957 follow. Some of the minor figures are estimates only due to the fact that the report has to be prepared before the various utilities have completed their statistics for the past year. These minor estimates will not be in error by more than 1% or 2%, so that the error in the whole will be negligible. Wherever a figure has been estimated it is marked "Est."

Tables 10 to 13 deal with plant capacity, peak load, and K.W.H. generated. They break up the figures to show what was generated by hydro, steam and internal combustion engines, and also to show the proportions generated by the publicly owned and the privately owned plants. Table No. 13 gives further details of the generating plants and their output. It will be noted that it is divided into three groups, A. B. and C.

The largest, Group A., contains those power plants which are connected by transmission lines, so that we speak of them as being in the interconnected system. Group A. covers most of the Province. As well as including the towns served by the Calgary Power Ltd., and Canadian Utilities Limited, it includes the cities of Edmonton, Calgary, Red Deer and Medicine Hat, and the towns of Ponoka, Fort Macleod and Cardston. In most cases these places do not generate their own power, but purchase it from Calgary Power Ltd., and retail it to their inhabitants. This group includes the hydro plants of Calgary Power Ltd., which are rated as follows:

<u>Plant</u>		<u>Capacity</u>	
		<u>H.P.</u>	<u>K.W.</u>
Bearspaw	-	22,000	17,000
Ghost	-	67,450	51,000
Horseshoe	-	20,000	14,000
Kananaskis	-	24,000	19,000
Barrier	-	16,000	13,000
Cascade	-	46,000	36,000
Rundle	-	23,000	17,000
Spray	-	62,000	50,000
Three Sisters	-	3,600	3,000
Pocaterra	-	18,400	15,000
Interlakes	-	6,900	5,000
		<u>309,350</u>	<u>240,000</u>

Group B. takes in the Peace River country and includes the territory served by Canadian Utilities Limited and Northland Utilities Limited. The systems of these companies are tied together by transmission lines from Fairview to Rycroft and from Valleyview to High Prairie, so that now the whole of the Peace River country is one interconnected system.

Group C. includes various towns served by Northland Utilities Limited in the area north and west of Edmonton, and the town of McMurray served by Canadian Utilities Limited.

Group D. of former reports will no longer appear because transmission lines have now reached out to serve all isolated towns except those shown as presently being served as isolated communities by the large companies under Group C.

In 1957 the interconnected system shown as Group A. had a combined capacity of 574,900 K.W., and generated 2,191,041,000 K.W.H. It served 278,354 customers. This system accounts for 97% of the generating capacity of the Province, 97% of the K.W.H. generated, and 95% of the number of customers.

The interconnected system shown as Group B. (Peace River country), had a combined capacity of 14,520 K.W. and generated 42,354,000 K.W.H. and served 11,441 customers.

TABLE NO. 10

The following Companies or Municipalities provide Central Station Electrical Service in the Province. This table gives preliminary data as to their plant capacity, their loads, and the K.W.H. they generated net in 1957.

Privately Owned

<u>Name of Company</u>	<u>Plant Capacity Dec. 31/57 K.W.</u>	<u>Peak Load (KW) on plants during 1957</u>	<u>K.W.H. Gen. Net - 1957 (thousands)</u>
1.			
Calgary Power Ltd.	312,000	264,500	1,258,283
Canadian Utilities Ltd.	76,395 (1)	49,400	188,321 (2)
Northland Utilities Ltd.	13,035	77,000	25,561
East Kootenay Power Co. Ltd. (3)	12,500	4,100	81
1. Total:	<u>413,930</u>		<u>1,472,246</u>

Publicly Owned

<u>Name of Municipality</u>			
2.			
City of Edmonton	125,000	120,000	470,701
City of Lethbridge	13,500	12,200	50,716
City of Medicine Hat	43,400	41,300	249,511 (4)
2. Total:	<u>181,900</u>		<u>770,928</u>
Plus 1. Total:	<u>413,930</u>		<u>1,472,246</u>
GRAND TOTAL:	<u><u>595,830</u></u>		<u><u>2,243,174</u></u>

(1) Includes one 1,200 K.W. unit at Fairview.

(2) Includes some K.W.H. generated at Fairview.

(3) The East Kootenay Power plant is located at Sentinel some two or three miles inside the Alberta border. While this energy is generated in Alberta, most of it is exported to British Columbia.

(4) Includes 180,977,500 K.W.H. sold to Calgary Power Ltd.

TABLE NO. 11

It is interesting to rearrange the figures of Table No. 10 so as to list them according to whether the power was generated by hydro, steam or internal combustion plants.

HYDRO

Name of Company	Plant Capacity Dec. 31/57 K.W.	Peak Load (KW) on plants during 1957	K.W.H. Gen. Net - 1957 (thousands)
Calgary Power Ltd.	240,000	228,900	802,950
Northland Utilities Ltd.	1,600	750	4,308
Total Hydro:	241,600		807,258

STEAM

Calgary Power Ltd.	72,000	72,000	454,472
Canadian Utilities Ltd. (1)	68,500	42,800	161,749
East Kootenay Power Co. Ltd. (2)	12,500	4,100	81
City of Edmonton	125,000	120,000	470,701
City of Lethbridge	13,500	12,200	50,716
City of Medicine Hat	43,400	41,300	249,511 (3)
Total Steam:	334,900		1,387,230

INTERNAL COMBUSTION

Calgary Power Ltd.			861
Canadian Utilities Ltd.	7,895 (4)	6,400	26,572 (5)
Northland Utilities Ltd.	11,435	7,000	21,253
Total Internal Combustion:	19,330		48,686
GRAND TOTAL:	595,830		2,243,174

(1) Includes 8,500 K.W. Gas Turbine.

(2) See footnote (3) on Table No. 10.

(3) Includes 180,977,500 K.W.H. sold to Calgary Power Ltd.

(4) Includes 1,200 K.W. unit at Fairview.

(5) Includes some K.W.H. generated at Fairview.

TABLE NO. 12

The following table may be of interest as showing the relative position of steam, hydro and internal combustion in the Province, December 31, 1957.

<u>Method of Generation</u>	<u>% of Power Generated</u>	<u>% of Capacity</u>
Hydro	36.0	40.6
Steam	61.8	56.2
Internal Combustion	2.2	3.2
	<hr/>	<hr/>
	100	100
Publicly owned	34.4	30.5
Privately owned	65.6	69.5
	<hr/>	<hr/>
	100	100

TABLE NO. 13

SUMMARY OF GENERATING PLANTS IN ALBERTA

AS AT DECEMBER 31, 1957

Owner	Hydro		Steam		Internal Combustion	
	K.W. Rating	K.W.H. gener- ated, 1957 (thousands)	K.W. Rating	K.W.H. gener- ated, 1957 (thousands)	K.W. Rating	K.W.H. gener- ated, 1957 (thousands)
A. Within the inter-connected system						
Calgary Power Ltd. (only)	240,000	802,950	72,000	454,472		861
Canadian Utilities Ltd.			68,500	161,749		
East Kootenay Power Co. Ltd.			12,500	81		
City of Edmonton			125,000	470,701		
City of Lethbridge			13,500	50,716		
City of Medicine Hat			43,400	249,511		
TOTAL GROUP A:	240,000	802,950	334,900	1,387,230		861
B. Peace River Interconnected System						
Canadian Utilities Ltd.					7,370	25,912
Northland Utilities Ltd.					7,150	16,442
TOTAL GROUP B:					14,520	42,354
C. Isolated Systems						
Northland Utilities Ltd.						
Athabasca System						
Jasper	1,600	4,308			1,400	2,166
Lac La Biche					2,225	1,711
Ft. Vermilion (3 mos.)					485	927
					175	7
					4,285	4,811
Canadian Utilities Ltd.						
McMurray					525	660
TOTAL GROUP C:	1,600	4,208			4,810	5,471
TOTAL ALL GROUPS:	241,600	807,258	334,900	1,387,230	19,330	48,686
GRAND TOTAL:		595,830		2,243,174		

The following comments deal with the Province as a whole.

K.W.H. Generated. The increase in K.W.H. generated was 11%. The generation by the hydro plants decreased 18%, while that of the steam plants increased 39%. The hydro plants were operated in the most efficient manner possible, making the best use of all their water.

Internal combustion plants increased their output by 24%. This power, of course, is largely that generated by Northland Utilities Limited and Canadian Utilities Limited in the Peace River country where there has been a large increase in demand for power. This has been due in part to the increased activity in the Sturgeon Lake oil field, although the full impact of this field is not yet manifest. The percentage increase in output of internal combustion plants would have been greater if it were not for the fact that the extension of transmission lines has made it possible to shut down a number of small diesel plants.

Peak Load. The increase in peak load for the Province has been less than 2%. December, 1957, was a very mild month, which accounts in part for the small increase in peak load. Industrial activity slackened off some towards the end of 1957, particularly in respect to oil field pumping. As well as this some large industries which otherwise might have been expected to hold the peak load up have swung over to an off-peak basis. The following figures are an estimate of the actual coincident peak for the Province.

TABLE NO. 14

<u>System</u>	<u>Estimated Peak Load K.W., 1957</u>
Interconnected system, less East Kootenay Power Co. Ltd.	464,100
East Kootenay Power Co. Ltd.	3,650
Canadian Utilities Ltd. (Peace River country) (McMurray)	6,400 240
Northland Utilities Ltd.	7,700
	<hr/> 482,090
	say - 482,000

Transmission lines in the Province increased by 850^{*} miles to a total of 10,786, which includes 2,943 miles of Company-owned farm lines. Distribution line mileage increased 520^{*} miles to 4,006. The total mileage of all farm lines increased by 2,647 miles, so that the total farm mileage at the end of 1957 was 31,561. The total mileage of all power lines in the Province at the end of December, 1957, was 43,404.

* Some lines formerly reported as transmission have now been included under distribution.

TABLE NO. 15

Total Circuit Miles of Transmission Lines in the
Province by Regional Groups as at December 31, 1957.
This includes Company-owned Farm Lines, but does not
include the Co-operative-owned Farm Lines.

<u>VOLTAGE</u>					
	<u>2,300 to</u> <u>22,000 V.</u>	<u>33,000 V.</u>	<u>50,000 to</u> <u>72,000 V.</u>	<u>132,000 V.</u> <u>& greater</u>	<u>Total</u>
<u>A. Within the Interconnected System</u>					
Calgary Power Ltd.	5,659	59	956	970	7,644
Canadian Utilities Ltd.	1,472	233	385	84	2,174
City of Medicine Hat	30				30
East Kootenay Power Co. Ltd.	26		48		74
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
Total Group A.	7,187	292	1,389	1,054	9,922
<u>B. Systems Within the Peace River Country</u>					
Canadian Utilities Ltd.	277	30	107		414
Northland Utilities Ltd.	305		47		352
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
Total Group B.	582	30	154		766
<u>C. Isolated Towns</u>					
Northland Utilities Ltd.					
Jasper	27				27
Athabasca	50				50
Lac La Biche	15				15
Canadian Utilities Ltd.					
McMurray	6				6
	<hr/>				<hr/>
Total Group C.	98				98
TOTAL ALL GROUPS	<u>7,867</u>	<u>322</u>	<u>1,543</u>	<u>1,054</u>	<u>10,786</u>

TABLE NO. 16

SUMMARY OF DISTRIBUTION SYSTEMS IN ALBERTA

As at December 31, 1957

	Total Number of Customers Served (Includes Rurals)	K.W.H. Sold (Less Sales to other Co.s) (thousands) (Includes Rurals)	Circuit Miles of Line (Excludes Rurals)
A. Within the Interconnected System			
Calgary Power Ltd.	88,000	865,896	1,463
Canadian Utilities Ltd.	31,912	130,746	527
East Kootenay Power Co. Ltd. (1)	1,103	8,574	21
City of Edmonton	69,866	433,502	677
City of Calgary	64,000 (Est.)	395,000 (Est.)	680 (Est.)
City of Lethbridge	9,444	42,663	112
City of Medicine Hat	6,857	68,534	127
City of Red Deer	4,159	18,487	47
Town of Cardston	890	2,611	30
Town of Fort Macleod	902	2,612	20 (Est.)
Town of Ponoka	1,221	4,004	24
TOTAL GROUP A.	278,354	1,972,629	3,728
B. Systems Within the Peace River			
Canadian Utilities Ltd.	5,922	21,689	90
Northland Utilities Ltd., including High Prairie, McLenna, Valleyview and Manning	5,519	12,865	113
TOTAL GROUP B.	11,441	34,554	203
C. Isolated Towns			
Northland Utilities Ltd.			
Athabasca System	904	1,860	33
Jasper	642	5,180	22
Lac La Biche	325	840	8
Fort Vermilion (3 mos.)	42	7	3
Canadian Utilities Ltd.			
McMurray	302	499	9
TOTAL GROUP C.	2,215	8,386	75
<u>GRAND TOTAL :</u>	<u>292,010</u>	<u>2,015,569</u>	<u>4,006</u>

(1) Includes Towns of Coleman, Frank, Cowley, etc.

TABLE NO. 17

SUMMARY OF RURAL ELECTRIFICATION SYSTEMS IN ALBERTA
As at December 31, 1957

A. Within the Interconnected System	Number		Total Number Customers	Circuit Miles of Line
	Farmers Served	Non-Farmers Served		
Calgary Power Ltd.				
Experimental Areas and Individual Rurals (1)				
R.E.A.'s	4,000	833	4,833	2,368
	25,306	5,075	30,381	19,059
Canadian Utilities Limited				
Experimental Areas and Individual Rurals (1)				
R.E.A.'s	770	110	880	366
	8,085	706	8,791	7,372
East Kootenay Power Co. Ltd.				
R.E.A.'s and Lundbreck Co-op.	122	51	173	136
Adjacent to Cities, etc.	306		306	153
Total Group A.	38,589	6,775	45,364	29,454
B. Peace River Country				
Canadian Utilities Limited				
Experimental Areas and Individual Rurals (1)				
R.E.A.'s	69	99	168	34
	1,153	60	1,213	924
Northland Utilities Limited				
Experimental Areas and Individual Rurals (1)				
R.E.A.'s	125	125	125	19
	974	26	1,000	835
Total Group B.	2,321	185	2,506	1,812
C. Isolated Towns Served by Northland Utilities Limited				
Company-owned Rurals (1)				
R.E.A.'s	4	4	4	3
	216	28	244	292
Total Group C.	220	28	248	295
GRAND TOTAL:	41,130	6,988	48,118	31,561

(1) The lines to serve these farms are the property of the Power Companies. This mileage is also included in the table showing transmission lines under the heading of 2,300 to 22,000 volt lines, etc.

TABLE NO. 18

DATA RE CENTRAL ELECTRIC STATIONS IN ALBERTA BY REGIONAL GROUPS
As at December 31, 1957

	Group A	Group B	Group C	Total
<u>Plants</u>				
K.W. Rating	574,900	14,520	6,410	595,830
K.W.H. Generated (thousands)	2,191,041	42,354	9,779	2,243,174
<u>Transmission</u>				
Miles of Line	9,922	766	98	10,786
<u>Distribution</u>				
Number of customers	278,354	11,441	2,215	292,010
K.W.H. sold (thousands)	1,972,629	34,554	8,386	2,015,569
Miles of line	3,728	203	75	4,006
<u>Rural</u>				
Number of farms (1)	38,589	2,321	220	41,130
Number of non-farms (1)	6,775	185	28	6,988
Miles of farm line (2)	29,454	1,812	295	31,561
Miles of R.E.A. line (3)	26,567	1,759	292	28,618

(1) Included in Number of Customers shown under Distribution Lines.

(2) Partly included in Number of Transmission Lines.

(3) Not included in Miles of Line shown under Distribution or Transmission Lines.

The following is a more detailed summary of the additions to generating capacity, transmission line facilities, etc., during the year 1957.

Calgary Power Ltd.

(1) Changes in Plant Capacity

During 1957, work continued on the extension to the Wabamun steam plant which will add a second unit. This is a duplicate of the present unit and will be placed in operation in the fall of 1958. Operation of the first unit has shown that although rated at 66,000 kilowatts, it has a capability of 72,000 kilowatts.

The extension to the Cascade Plant, consisting of an 18,000 kilowatt unit, was placed in operation in October, 1957.

During 1957, work was commenced on extensions to the Spray and Rundle Plants which will add a 50,000 kilowatt unit to the Spray Plant and a 30,000 kilowatt unit to the Rundle plant. These units are scheduled for operation in the fall of 1959.

The preliminary investigations on the Brazeau River resulted in interest in one particular site and more detailed studies are in progress.

(2) Additional Transmission Lines

During the year 1957, the Company built the following transmission lines:

Ghost to Edmonton	138 K.V. Added ground wires and added one extra conductor to each phase for 100 miles on the existing 173 miles of line.
Wabamun to Evansburg	138 K.V. Operating at 69 K.V.
Evansburg to Wildwood	69 K.V.
6 miles in Pembina Oil Field	69 K.V. Operating at 23 K.V.
4 miles Keystone Oil Field	69 K.V. Operating at 23 K.V.
Barrhead to Fort Assiniboine	23 K.V.
Buck Creek to Alder Flats and Minnehik	23 K.V.
Elkton to Cremona	23 K.V.
11.1 miles Pembina Oil Field	23 K.V.
5.6 miles East Edmonton sub. south and west to SW 13-52-24	23 K.V.

At the Edmonton City power plant a 66.7 M.V.A. 135/72 K.V. regulating auto transformer has been installed to more than double the interconnecting capacity, formerly 25 M.V.A.

At the Cascade plant, a 40 M.V.A. 138/13.2 K.V. transformer has been installed replacing the 18,750 K.V.A. transformer previously installed.

At Camrose, a 10,000 K.V.A. 72/23.9 K.V. transformer has been installed.

A new substation was built near the Cloverleaf in N.E. Calgary. A 5000 K.V.A. 69/13.2 K.V. transformer was installed.

A new substation was built at Aeroplane Corner, Calgary (Center Avenue and 54th Street West). A 5000 K.V.A. 69/13.2 K.V. transformer was installed.

A new substation to serve Trans Mountain Pipelines was constructed at Niton. A 5000 K.V.A. 69/23.9 K.V. transformer was installed.

An additional 5000 K.V.A. transformer was installed in the Gainford substation to replace a 3000 K.V.A. transformer formerly installed.

At Drayton Valley a 10,000 K.V.A. 69/23.9 K.V. transformer was installed replacing the 5000 K.V.A. transformer previously there.

At Holden a 69 K.V. interconnection with the Canadian Utilities Limited is nearing completion.

(3) During the year the following Towns, Villages and Hamlets were added to the system of Calgary Power Ltd.

Towns:	Edson
Hamlets:	Alder Flats
	Bragg Creek
	Buck Lake
	Ebling Subdivision
	Elkwater
	Fallis
	Fort Assiniboine
	Mackay Corner
	Niton Junction
	Willow Beach Subdivision.



"New extension to Wabamun Plant of Calgary Power Ltd. to house second 66,000 K.W. gas-fired steam unit."

Courtesy David Miller

(4) Service to Oil Fields, New Industries, etc.

During 1957, Calgary Power Ltd. received applications for an additional 540 oil well pump services and 125 additional battery pumping services, bringing total applications to 4,340 oil pumps to date. Service was extended during 1957 to some 1,000 oil wells and 100 battery pumps. These services have been added in the Pembina, Joffre, Bentley, Clive, Duhamel, Hughenden, Innisfail, Keystone, Leduc and Sundre Fields.

In addition to the above, electric power is now being provided for several water flood projects at Joffre and Pembina as well as for L.P. Gas injection at Pembina.

Coal mining load continued to decrease, with some mines closing in the Crowsnest and Lethbridge areas.

The largest industrial loads connected during the year were three crude oil pumping stations totalling over 12,000 H.P. connected load. However, due to crude oil market conditions, relatively little power is presently being consumed by this load. New gravel plants, planing mill, strip coal mine, stock feed processing plants and others were connected. Increases were experienced in many industrial loads, with the largest being the addition of a second electric arc furnace.

Canadian Utilities Limited

(1) Changes in Plant Capacity

During the year Canadian Utilities Limited completed tests on the 10,000 K.W. gas turbine generating station at Sturgeon Lake. This plant is unique in that it is believed to be the only such turbine utilizing flare gas. This fuel is readily available from the neighbouring South Sturgeon Lake oilfield. In return the new generating station will supply the power to pump the oil from the wells and down the 100 mile Valleyview to Edson pipeline.

In January, 1957, Canadian Utilities Limited acquired the assets of

McMurray Light and Power Company Limited, including a 150 K.W. 225 H.P. Fairbanks and a Vivian and Murphy Unit. During October the plant was rewired and a 325 H.P. Caterpillar diesel generating unit with a capacity of 225 K.W. was installed.

(2) Transmission Lines

During the year Canadian Utilities Limited constructed a line from the Sturgeon Plant to Valleyview and a line from Joussard to Faust, Kinuso and Slave Lake. This completes the interconnection and makes possible the supply of power from the Sturgeon Plant to all the Slave Lake communities, with the exception of Smith.

The following transmission lines were built by the Company this year:

25 miles 69 K.V. line from Vegreville to Holden to increase the capacity of ties with the Calgary Power system.

5½ miles 69 K.V. line to connect the Sturgeon plant to the existing 69 K.V. line from Clairmont.

11 miles 69 K.V. line from Sturgeon plant tying to Northland Utilities Limited system at Valleyview.

16 miles 23.9 K.V. line from Canyon Creek to Kinuso.

14 miles 23.9 K.V. line from Joussard to Faust.

11 miles 23.9 K.V. line completed from the Clairmont switching station to Grande Prairie.

7 miles 23.9 K.V. line from McMurray to the McMurray Airport.

Substation additions were made during the year as follows:

Vegreville - a new substation containing a 6,000 K.V.A. on-load-tap-changing transformer and circuit breakers for 4 outgoing 25 K.V. feeders and one 34.5 K.V. feeders has been built.

Clairmont - switching and transformer station: - four 25 K.V. oil circuit breakers and a 6,000 K.V.A. transformer have been installed. This substation is now the main tie point for the three plants.

Sturgeon plant substation: - This is a new substation with a total of 10,500 K.V.A. in transformer capacity. Its function is to step up the voltage of the power from the new gas turbine generator, for transmission to the various loads.

(3) Towns and Villages added to the Company's system in 1957

Little Smoky River Settlement, Calais, Canyon Creek, Slave Lake, Smith,	Widewater, Sturgeon Heights, Wagner, Saddle Lake, Watts.
--	--

Northland Utilities Limited

(1) Changes in Plant Capacity

During the year the Company increased the capacity of its Fairview plant by the installation of a 3,000 K.W. diesel unit. This made it possible to move a 500 K.W. unit from that plant to Athabasca. The Company also installed another unit of 1,200 K.W. capacity in its Jasper plant and one of 300 K.W. in its Lac La Biche plant.

In addition to this the Company installed a plant in the Hamlet of Fort Vermilion and rebuilt the distribution system there.

(2) Transmission Lines

Valleyview to Triangle	-	47 miles	-	72 K.V.
Fairview to Hines Creek	-	15 miles	-	23.9 K.V.
Enilda to Joussard	-	20 miles	-	23.9 K.V.

The installation of these circuits now means that loop service is possible through interconnections for the entire Peace River area. Construction during 1958 will increase the capacity of this loop so that there should be no occasion for prolonged outages to make repairs or improvements.

(3) Towns and Villages added to the Company's system in 1957

Ft. Vermilion.

City of Edmonton

Changes in Plant Capacity

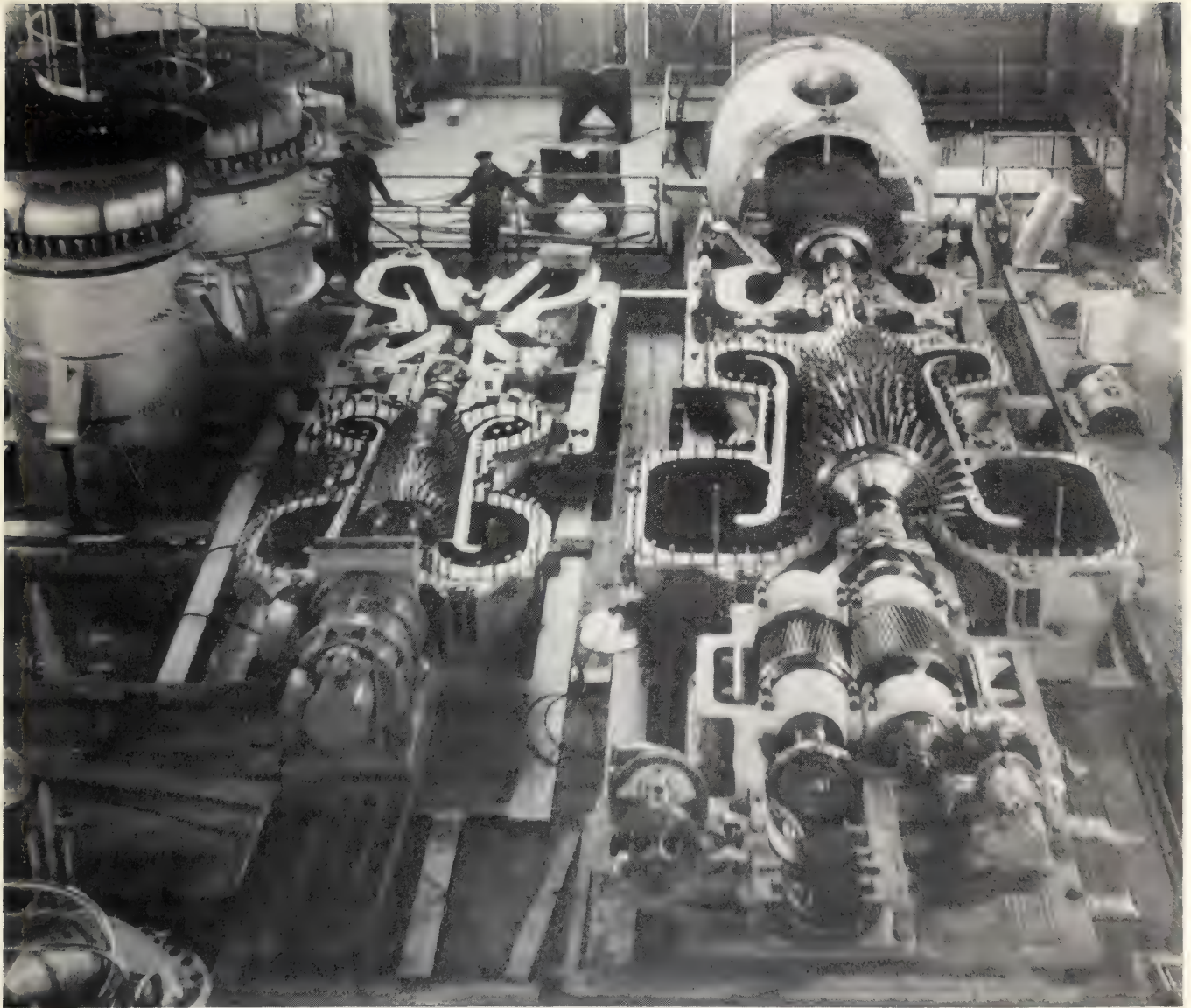
Good progress has been made during the year in the installation of a 30,000 K.W. gas turbine which is expected to be commissioned early in 1958. A similar unit is scheduled for completion in 1958 or early in 1959. These gas

turbines units, one of which is illustrated elsewhere in the report, are the largest gas turbines installed anywhere in the world. While there are other similar units being installed elsewhere in Canada, Edmonton's units will generate the highest electrical load. As the temperature decreases gas turbines can be operated at higher loads. For this reason these units will be operated at a higher load than in similar turbines anywhere else in the world.

City of Lethbridge

Changes in Plant Capacity

Preparations are being made for the installation of a 10,000 K.W. gas turbine which is expected to be brought on the line during 1958.



"Edmonton's first 30,000 K.W. Gas Turbine - World's largest."

Courtesy City of Edmonton

FORECAST TO 1962

At December 31, 1957, the capacity of the power plants in the Province was 596,000 K.W. At December 31, 1947 - 10 years ago - this capacity was 158,000 K.W., so that the increase during the 10 year period has been 277%, an amazingly large increase. The K.W.H. generated in 1957 were three and one-half times the amount generated 10 years ago and showed an increase of 11% over the corresponding figure for 1956. Peak load, however, increased less than 2%. December, 1957, was a very mild month which probably accounts in part for the small increase in peak load. The remainder of the lack of increase is due somewhat to slightly lowered industrial activity, mainly occasioned by cutbacks in the amount of oil marketed. One of the main reasons, however, why the peak load is considerably less than might have been expected is that some large industries swung over to an interruptable basis during 1957 and some of these found it to their advantage to so regulate their activities as to keep their main load off the peak load period.

Table No. 19 shows the growth which we believe will take place in the electrical load of the Province from now until 1962. It shows the actual capacity in K.W. of the power plants in the Province as at December 31, 1957, the increase in capacity during 1957 and the estimated peak load that occurred in 1957. It then goes on to deal with these year by year until 1962, showing our forecast of peak load and what the Companies and Municipalities are planning to do to meet that peak load.

It will be seen from a study of Table No. 19 that there was ample reserve capacity to meet the load in 1957. The Power Commission has always felt that there should be enough reserve capacity in the power plants of the Province so that if the largest unit should break down during the December or January peak load period there would still be enough capacity to carry the load. The largest unit in the Province at the moment is a 70,000 K.W. generator in the Wabamun plant. If this had broken down during the peak load in December, 1957, the various power plants, by pooling their resources, could have carried the load.

It appears that if the present plans for additional units are carried out we should have ample reserve capacity until 1962. It is hard to predict what the peak load will be five years from now. It will be noted from Table No. 19 that during the forecast period it is planned to put in four gas turbines. Canadian Utilities Limited, who installed the first one in Canada at their Vermilion plant, are well satisfied with this unit and are at present installing another in the Peace River country, while the City of Edmonton is proceeding with the installation of two more. The City of Lethbridge is also installing a gas turbine. While gas turbines are not as economical as either diesel engines or gas fired steam plants in the cubic feet of gas used to produce a K.W.H., they do have a definite place in the production of power in Alberta. For one thing, they can use "sour" gas, which could not be used in diesel engines without scrubbing. Another advantage is that their installed cost per H.P. is considerably less than other prime movers. For this reason it is more economical to install them to handle peak loads where the load factor on the turbine will not be very high.

During 1956 the Calgary Power Ltd.'s Wabamun unit of 70,000 K.W. came on the lines. This is the largest unit in Alberta. A duplicate unit is now under construction and is expected to be in service by the fall of 1958. From now on it will be necessary to have 70,000 K.W. of spare capacity at all times. As the electrical load in the Province grows we may expect the size of these units to increase and by 1961 we expect to see a unit of 150,000 K.W. operating in the Province. These large steam units are considerably more efficient than smaller ones and installation of such large units will tend to keep the cost of power down. At the same time experience seems to point to the fact that these large steam turbines are a little more vulnerable to breakdown than hydro units. This being the case, it becomes increasingly important to watch our reserve capacity.

The question of reserve capacity is tied up with the question of interconnecting transmission lines between the various systems. This problem is always being considered and will receive more study in the future. The Province is very

fortunate in having a Power System Analyser in operation at the University. This was donated to that institution by Calgary Power Ltd. Not only will it be of great assistance in studying the problems of interconnections within the Province but it is anticipated that it will be used by the utilities operating in the other two Prairie Provinces.

Interrelated with this problem of connecting tie lines is the question of extending the transmission system to some of the more remote areas of the Province not now served by Central Station Power. The Commission, along with the Companies, has been making a study of this problem and hopes to continue this study next year. Ultimately the transmission network must be extended until there is no area of any reasonable population which is not served either by the main interconnected system or by that in the Peace River country, and it may not be too long before that country will be connected in to the remainder of the Province.

TABLE NO. 19

Forecast of Generating Capacity in K.W.
(Not taking account of isolated small plants)

	<u>Capacity added during year</u>	<u>Capacity at end of year</u>	<u>Estimated Peak Load</u>
Capacity at Dec. 31, 1956		573,164	475,000
<u>Capacity added during 1957</u>			
Calgary Power Ltd. - Cascade	18,000		
Northland Utilities Ltd.	4,700		
Less minor revisions	- 34		
	<hr/>		
Capacity added during 1957	22,666	22,666	
Total capacity Dec. 31, 1957		<u>595,830</u>	
		say 596,000	482,000
<u>Capacity to be added 1958</u>			
Calgary Power Ltd. - Wabamun	72,000		
Canadian Utilities Ltd. - Gas turbine	10,000		
City of Edmonton - two gas turbines	60,000		
City of Lethbridge - Gas turbine	10,000		
	<hr/>		
Capacity to be added 1958	152,000	152,000	
Total capacity Dec. 31, 1958		<u>748,000</u>	530,000
<u>Capacity to be added 1959</u>			
Calgary Power Ltd. - Spray	50,000		
Calgary Power Ltd. - Rundle	30,000		
Northland Utilities Ltd. - Fairview	3,000		
Northland Utilities Ltd. - Jasper	1,200		
	<hr/>		
Capacity to be added 1959	84,200	say 84,000	
Total capacity Dec. 31, 1959		<u>832,000</u>	580,000
<u>Capacity to be added 1960</u>			
City of Edmonton - Steam turbine	75,000		
City of Lethbridge - Gas turbine	10,000		
	<hr/>		
Capacity to be added 1960	85,000	85,000	
Total capacity Dec. 31, 1960		<u>917,000</u>	640,000

- carried forward -



Power System Analyzer donated to University of Alberta by Calgary Power Ltd.

Courtesy David Miller, Photographer.

TABLE NO. 19
continued

Totals brought forward -		917,000	640,000
<u>Capacity to be added 1961</u>			
Calgary Power Ltd. - Wabamun	150,000		
Northland Utilities Limited	1,200		
City of Lethbridge	10,000		
	<hr/>		
Capacity to be added 1961	161,200	say 161,000	
Total capacity Dec. 31, 1961		<u>1,078,000</u>	710,000
<u>Capacity to be added 1962</u>			
Canadian Utilities Ltd.	30,000		
Northland Utilities Limited	8,000		
	<hr/>		
Capacity to be added 1962	38,000	38,000	
Total capacity Dec. 31, 1962		<u>1,116,000</u>	800,000

FARM ELECTRIFICATION

During 1957, 3,472 farms have been added to the number already electrified in the Province, to make a total of 41,130 bona fide farms electrified as at the end of the year. It is expected that another 3,000 farms will be electrified during 1958. Most of the farms in the better soil areas of the Province have already taken service. From here on the extension of farm electrification into the more marginal areas will take place at a slower pace. The legislation passed in the spring of 1956 extending the term of financing from 10 to 25 years has been of considerable assistance to the farmers in these more marginal areas.

There has been a remarkable development of farm electrification in the special areas. Many R.E.A.'s have been organized and completed the construction of their lines in these areas where the average distance between farms has been approximately 1 3/4 miles. At least three more R.E.A.'s in this part of the country are slated for construction in the spring of 1958.

During 1957 a great deal of construction of farm lines has taken place in more marginal areas of the Province. Many of these construction jobs were not finished at the end of the year. These areas could not have gone ahead without help of the Part 2 legislation. The benefit of this Act was particularly noticeable in the Alder Flats area and straight west of Edmonton between Wabamun Lake and Edson, where four R.E.A.'s have their lines under construction. These are Entwistle-Magnolia, Carrot Creek, Wildwood and Edson-Fulham. Construction was completed for the Fort Assiniboine R.E.A. and this carries farm electrification to the edge of settlement beyond the Athabasca River. Construction was completed for two relatively small R.E.A.'s between Bonnyville and Cold Lake. There are now no areas in the Province south of the Peace River country where, as far as we can see, it will be necessary to create a new R.E.A. The farmers' power lines are now within reasonable reach of all areas of the Province south of the Peace River country.

In the Peace River country a similar network of lines exist. Construction work is under way in some of the rather remote corners of that country. Lines

are being built in the Baytree-Bonanza area and in the Peace Grove - Worsley R.E.A., which serves the country as far north and west as beyond Worsley. All the better farming areas in the Peace River country now have farm electrification available to them.

The following table shows the number of farms connected as of December 31st, 1957, as well as those still under construction. It also shows the number of non-farm customers served off farm lines.

This table brings out one other point that is often overlooked; that is, the number of non-farmers, such as filling stations, machine shops and country stores, and the number of customers in hamlets who are getting service off these farm lines, and are able to get service only by virtue of the fact that these farm lines have been built. It should be remembered that service to these customers was possible only due to the spread of farm electrification. It should also be borne in mind that, in many cases, the fact that these hamlets were within the area covered by an R.E.A. made the overall cost of joint service low enough to make it feasible for the farmers to build their lines. The farmers and the hamlet customers are mutually dependent.

While there are 41,130 bona fide farmers connected, farm electrification also served 6,988 non-farm customers who would not have obtained service otherwise. The total number benefiting by the construction of these farm electrification lines is, therefore, 48,118.

There are 1,894 townships in Alberta in which there are 15 or more farms. Farm Electrification lines have been built or are under construction in 1,845 of these, leaving 49 such townships which at the end of 1957 did not have any farm electrification. In these 49 townships we expect to see service extended to about 19 of these during 1958. This leaves 30 townships in which farmers have made no immediate plans for bringing about farm electrification, although it is quite likely that before the end of 1958 plans will be under way in several of them. According

TABLE NO. 20

ALBERTA POWER COMMISSION

Combined Figures for Alberta

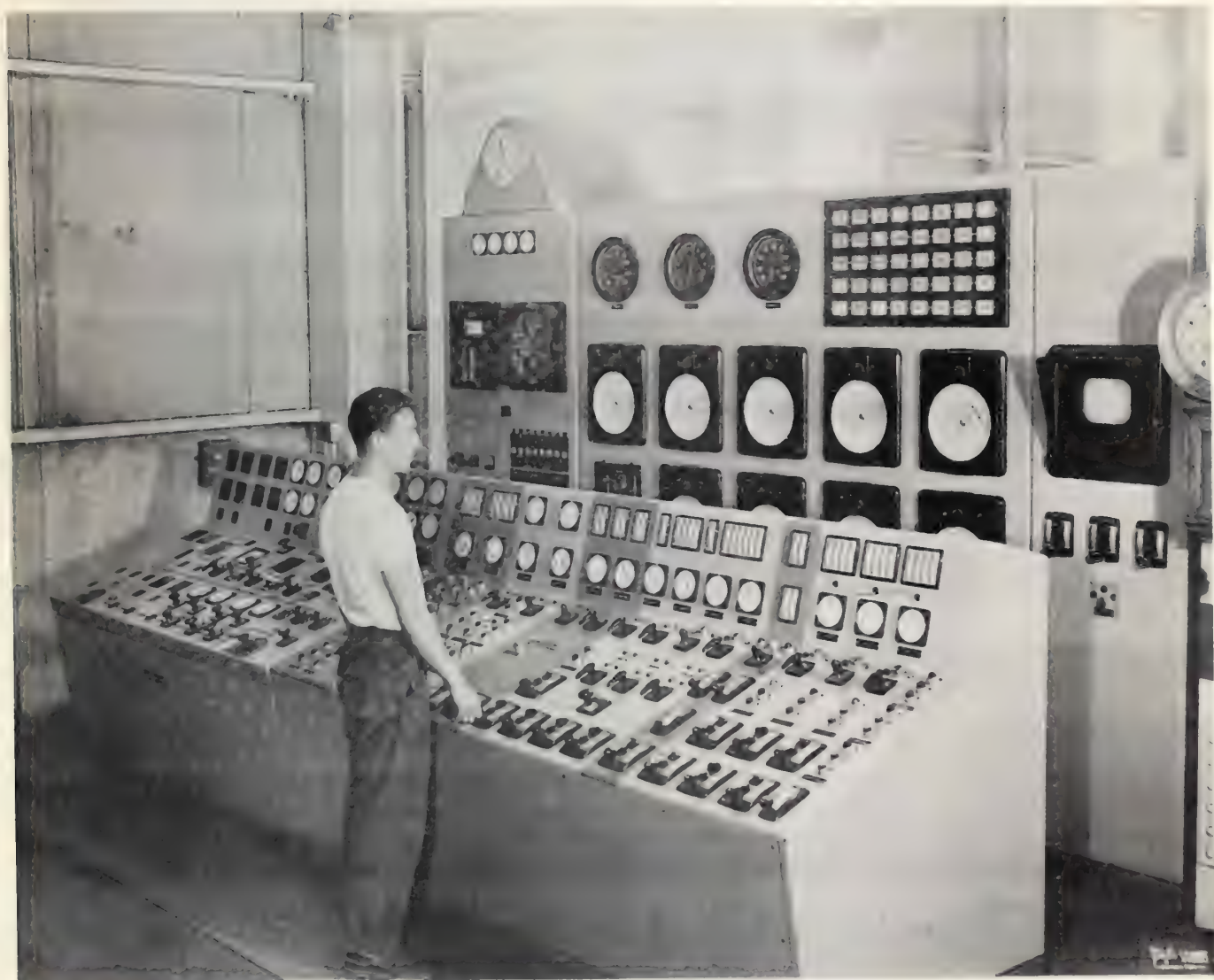
Farm Electrification as at December 31, 1957

	No. Farms Connected	Non-Farms	Hamlet Customers	Total Non-Farm Customers	Total Served off Farm Lines
Experimental Areas	3,055	581	461	1,042	4,097
Completed R.E.A.'s	35,859	2,214	3,732	5,946	41,805
Individual Rurals	1,917				1,917
Farms supplied by Cities	299				299
Total Actually Served	41,130	2,795	4,193	6,988	48,118
* UNDER CONSTRUCTION					
	No. Farms Under Construction	Non-Farms	Hamlet Customers	Total Non-Farm Customers	Total Served off Farm Lines
New Areas	519	7		7	526
Additions to old areas	1,412	14		14	1,426
Total under construction	1,931	21		21	1,952

Number of farmers in Associations organized or quite definitely requesting service but not yet under construction -

	New Areas	Additions to Old Areas	Total
Other Groups or Individuals that are in sight with reasonable certainty for farm electrification within 18 months -	412	101	513
	165	435	600

* 'Under Construction' includes any farmers at any stage of construction from staking to energizing.



"Operating panel in Battle River steam station of Canadian Utilities Limited."

Courtesy Wells Studios

to the 1956 Census, the total number of farms in these 30 townships is approximately 500.

In connection with the 49 townships having more than 15 farmers each which are not served at the moment, many of these townships are quite close to existing farm electrification lines, as will be seen from the table below which shows the number of townships which are only the following distances from existing lines:

<u>Distance from Existing Lines to Nearest Point of Township</u>				
<u>1 mile</u>	<u>2 to 3 miles</u>	<u>4 to 5 miles</u>	<u>6 to 10 miles</u>	<u>Over 10 miles</u>
17	15	5	5	7

Thirty-two of these townships are within three miles of existing lines, and another 5 are within five miles, so that if the farmers in them were to take active steps towards getting farm electrification it would not be very difficult to obtain it. In other words, when seeking the reason why there is no service in these 49 townships, the answer does not lie in the fact that they are too remote from the network of lines. It lies in the fact that, generally speaking, the farms in these townships are in (1) new areas which have not been settled long, or else are (2) in marginal areas which in some cases have been settled for forty or fifty years but in which the farmers are deserting their farms for the higher incomes they can obtain in the cities.

1. The new areas that have not been settled long are in the Peace River country. In these areas land is being broken up at a fairly rapid rate, but in many cases the owners have concentrated on breaking more land and, for the time being, have left their families in the nearby town so that they have not yet established a worthwhile home on their land. There does not seem to be much doubt that as fast as these farmers can do so they will build homes and will go out to their farms to live. In such areas we may expect prosperous farming communities to develop within the next few years. Even now there is a demand for farm electrifi-

cation in such areas but there are not yet enough resident farmers to make the extension of the lines feasible at the moment.

2. In the marginal areas, which in some cases have been settled for forty or fifty years, the picture is not so clear. In many of these townships there are people classed as farmers who in reality farm on a very limited scale and depend on fishing, trapping or lumbering for enough additional income to eke out a living. While these people call themselves farmers, in reality they live on poor soil and from one year's end to another do little or nothing to improve the status of their farms. It is not clear when farm electrification may be extended to such townships.

There are other townships, however, in this same area north of the North Saskatchewan River, in which the majority of the inhabitants do farm on rather poor soil but in which they receive the bulk of their income from farming. In nearly all such townships there are some prosperous farms and these are an indication that farming can be carried out successfully in these areas, and, of course, will be so carried out when the day comes that there is a greater demand for farm products, - particularly hogs, cattle and forage crops. Many farmers in such a township are anxious to obtain farm electrification and will go to great lengths to do so. For these farmers the recent Part II legislation has been and will be a great help. The remainder of the farmers in the township are uncertain of their future on the land they occupy at present. We believe that these areas have not yet reached their minimum farming population. While many farms have either been wholly abandoned or are farmed on a rental basis by the better farmers who remain in the area, this process of farmers moving away has not yet reached its limit, so that in these areas still more farmers will move to the cities. We may expect, however, that within the next few years that process will reach a limit and that we will be left with farmers who either own or rent enough land which they farm properly that they will make a reasonable income. These farmers who remain will

need farm electrification in their operations but may be so scattered that supplying them will present some problems which may be beyond the ability of the Part II legislation to solve. This, however, is a question with which we can deal when and if it arises.

The 1956 Census indicates that there are 79,425 farms being operated in Alberta. Of these there is no-one living on 9,366 farms, so that there are 70,058 farms on which someone resides. The figures given in the 1956 Census appear to us to be too high because in our travels around the country this number of farmers do not appear to be in evidence. The Power Commission had hoped during the fall of 1957 to make a complete survey of some areas to find out how many farmers were living in those areas but had not yet taken service. Unfortunately this work had to be postponed but we hope to be able to carry it out during 1958.

By the end of 1958 the network of farm electrification lines will have entered nearly every township in the Province which has more than fourteen farmers living in it and many townships having less than that number. When we have reached that point some 45,000 farmers will have the benefits of farm electrification. From then on farmers hooking up will be those who are adjacent to or very close to the lines of an existing R.E.A., and who can get service from these lines. At what rate these will wish to hook up remains to be seen but we believe that some 2,500 may do so each year for a few more years. While we believe that ultimately farm electrification will be extended to 85% of the farms that remain occupied, it is hard to predict how many that will be and therefore hard to predict what is the maximum number of electrified farms we may expect.

The saturation of electrified farms by Census Divisions is shown in the map on Page 43. This map shows the Census Divisions as they were at 1951 and a similar map has been presented in previous Reports. The Census Divisions were changed during 1956 and it has not been possible to work out the necessary comparisons and map based on the 1956 Census. This, however, will be available in the next Annual Report. As mentioned previously, according to the 1956 Census there are 70,058

farms on which someone lives. If, as we expect, Alberta's ultimate saturation of electrified farms reaches 85%, this would set the figure for the number of farms which we might expect to become electrified at about 60,000. On this basis we may consider then that farm electrification in the Province is 69% completed.

The figures in the following table show the progress of farm electrification in another way. In preparing the table we have zoned the Province into areas that could be served most economically by each power company and we have included the farms in these areas in our calculations.

Saturation in Areas Served by
the following three Companies only at December 31, 1957

	<u>Farm Electric Services</u>	<u>Canadian Utilities Limited</u>	<u>Northland Utilities Limited</u>	<u>Total</u>
(a) Total farm residences occupied				70,058
(b) Total of these within area served by each Company	43,265	21,054	4,681	69,000
(c) Probable ultimate saturation 85%	36,780	17,890	3,980	58,650
(d) Farms served by each Company	29,306	10,077	1,319	40,702
(e) Farms served by each Company as a percentage of (c)	79.7%	56.3%	33.2%	69.4%

The map on Page 43 shows the Census Divisions in the Province and the number of farms in each according to the 1951 Census. During 1956 the boundaries of Census Divisions were revised but for the purposes of this report we are continuing to use the Census Divisions as used in previous reports.

The other two maps included in the report show the electrified areas of the Province as at December 31, 1957. This is on the same basis as the map in the last Annual Report in that a section of land is blacked in if farm electrification is installed on or is under construction to any quarter of that section. All areas which at present have no prospect of being settled have been left blank

Alberta Power Commission
Map Showing
CENSUS DIVISIONS OF ALBERTA
With Table Showing
NUMBER OF ELECTRIFIED FARMS

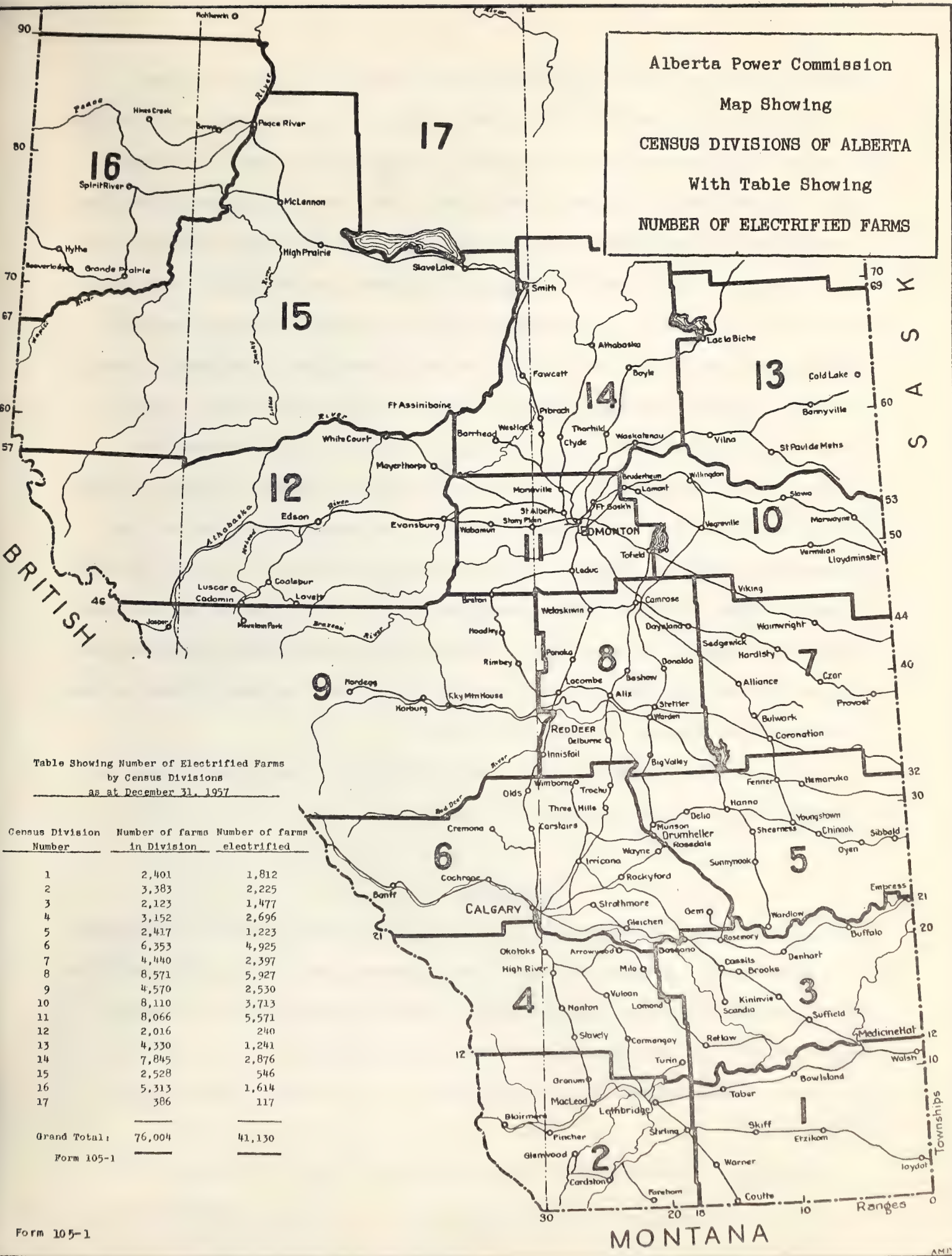


Table Showing Number of Electrified Farms
by Census Divisions
as at December 31, 1957

Census Division Number	Number of farms in Division	Number of farms electrified
1	2,401	1,812
2	3,383	2,225
3	2,123	1,477
4	3,152	2,696
5	2,417	1,223
6	6,353	4,925
7	4,440	2,397
8	8,571	5,927
9	4,570	2,530
10	8,110	3,713
11	8,066	5,571
12	2,016	240
13	4,330	1,241
14	7,845	2,876
15	2,528	546
16	5,313	1,614
17	386	117
Grand Total:	76,004	41,130

Form 105-1

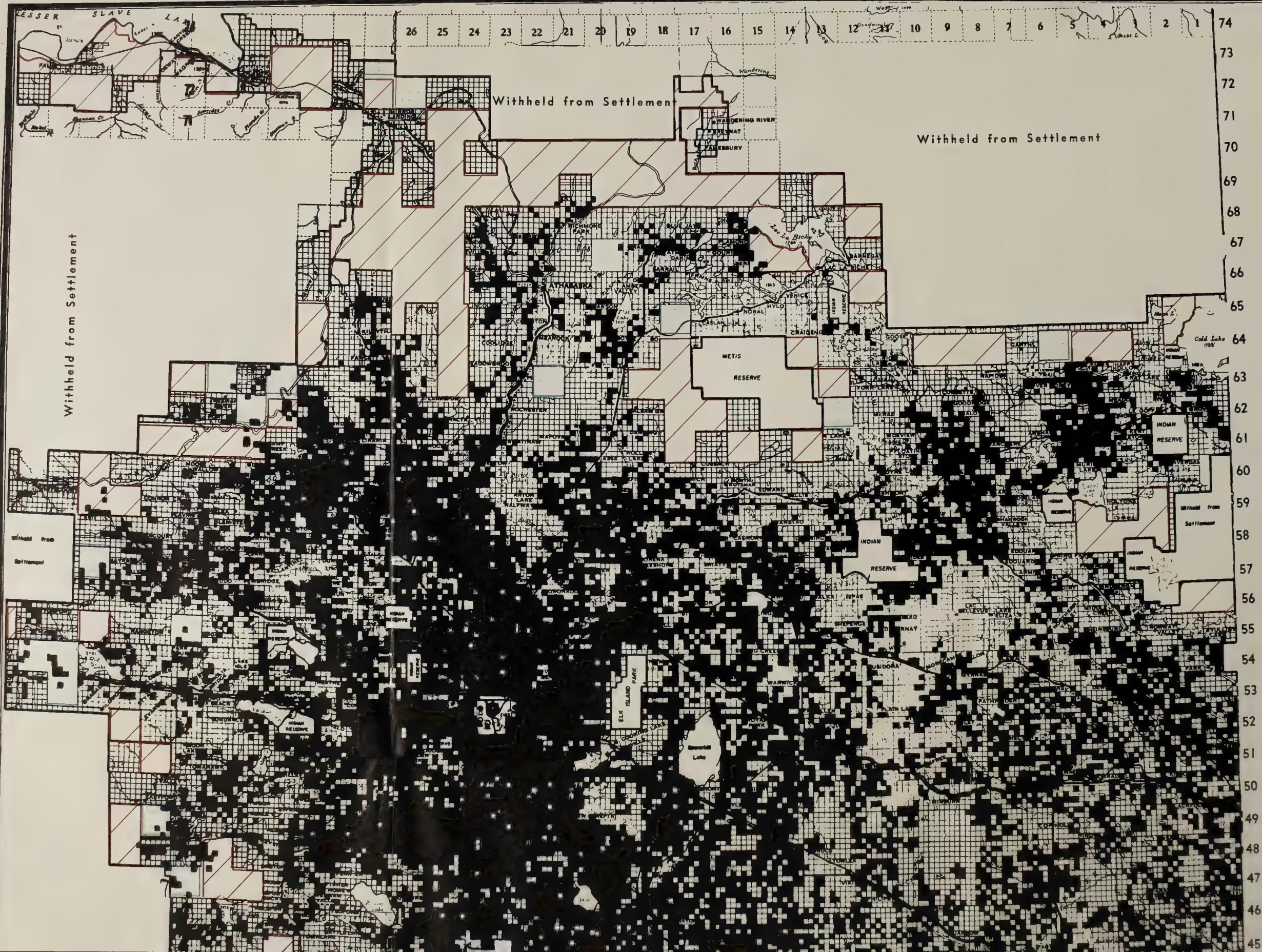
on the map with the notation "Withheld from settlement". These areas are either mountainous, forested or have such a type of soil that settlement on them for agricultural purposes is not advisable. In addition to these, all parks, Indian Reserves, etc., have been blocked out. Even after withdrawing these from the map there are still other areas around the fringe of the map where the land has been surveyed but in which the number of farmers per township is very small - of the order of one or two. Townships 65 to 69 in Range 25, west of the 5th Meridian, are examples of this. There are still townships in the Special Areas, Townships 22 to 27, in Ranges 5 to 16, inclusive, and others, where a similar density of farmers prevails, and into which it will be almost impossible to introduce farm electrification. The areas in which the number of farms per township is less than 10 are indicated by means of red crosshatching and by blue crosshatching where the number of farms per township is from 10 to 14. The 1956 Census indicates that some of the townships in the fringe areas of the Province which formerly had 15 or more farmers living on them have become depopulated so that now they contain less than 15 farmers. The map has not been altered to take into account the changes from the 1951 Census.

At the end of December, 1957, there were 31,561 miles of farm lines and during the year 2,647 miles had been constructed.

Financing

At the end of December there was a total of 368 active Rural Electrification Associations. These Associations have borrowed under both the Guarantee Act and the Revolving Fund Act and the total of these borrowings has been nearly \$26,000,000.00. At December 31, 1957, nearly \$10,000,000.00 of this had been paid back. The investment in all rural lines in the Province is approximately \$40,000,000.00.

The Rural Electrification Revolving Fund Act, which was passed at the



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Withheld from Settlement

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METIS RESERVE

ELK ISLAND PARK

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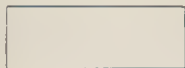
This is a detailed map of the Wainwright, Alaska area, overlaid with a grid. The map shows various geographical features, including lakes, rivers, and roads. Key locations labeled include Wainwright, Wainwright Park, and the Suffield Experimental Area. Several Indian Reserves are also marked, including the Indian Reserve in the upper left, the Indian Reserve in the lower left, and the Indian Reserve in the lower right. The map is oriented with North at the top. The grid lines are spaced at regular intervals, and the map is divided into sections by a vertical line. The map is a black and white reproduction of a color map, with the grid lines and labels in black. The background is white, and the map features are represented by black lines and shading. The map is a detailed representation of the Wainwright area, showing the layout of the town and the surrounding landscape. The grid overlay is a key feature of the map, providing a reference system for locating specific areas. The labels for the Indian Reserves and the Suffield Experimental Area are clearly visible, providing context for the map's content. The map is a valuable resource for understanding the geography and history of the Wainwright area.

AREAS OF SPARSE POPULATION

FARMERS per TOWNSHIP



less than 10



10 to 14

REVISED
DEC. 31, 1952
DEC. 31, 1953
DEC. 31, 1954
DEC. 31, 1955
DEC. 31, 1956
DEC. 31, 1957

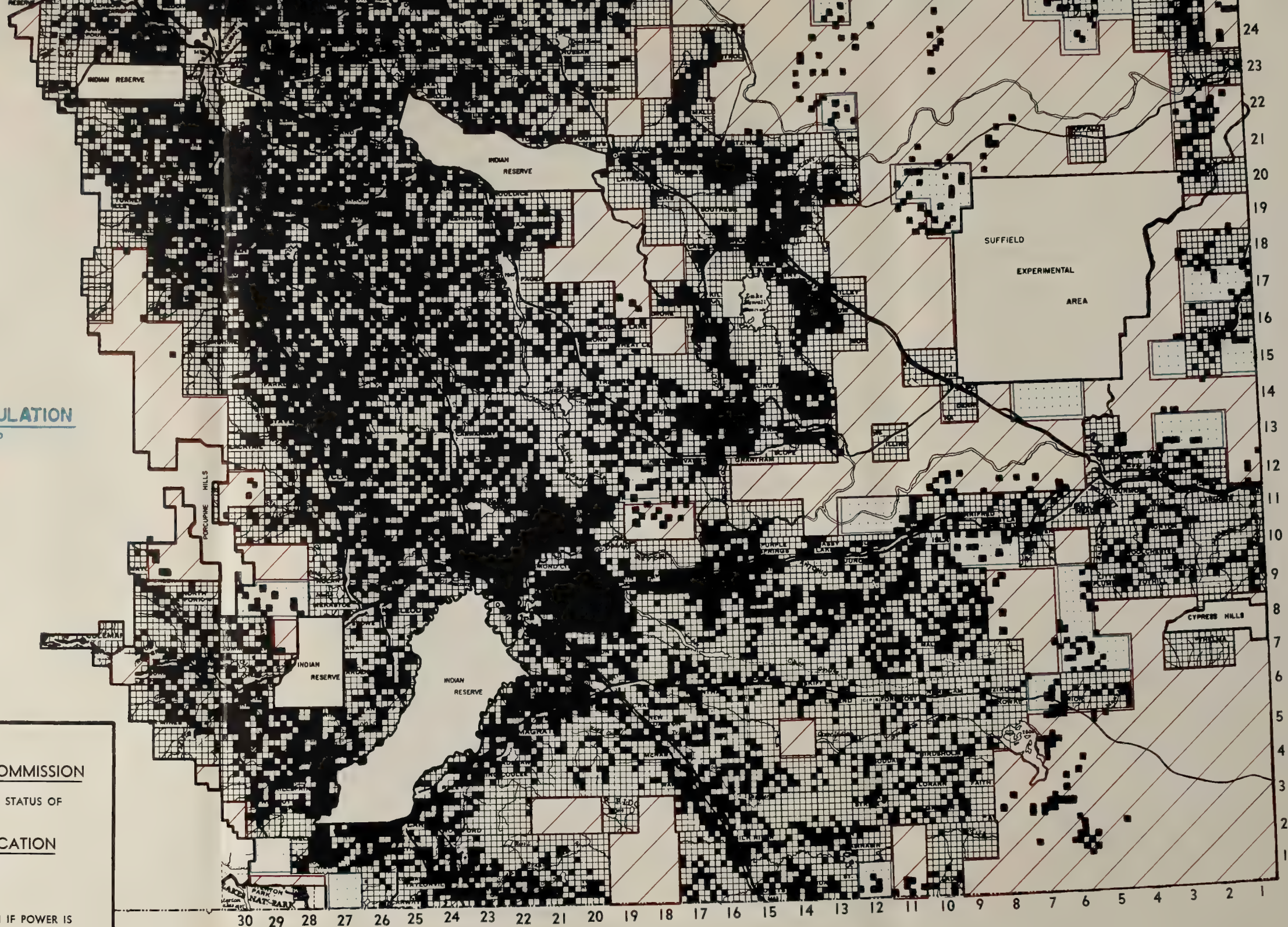
ALBERTA POWER COMMISSION

MAP SHOWING PRESENT STATUS OF

FARM ELECTRIFICATION

IN ALBERTA

A SECTION IS BLACKED IN IF POWER IS
AVAILABLE TO ANY QUARTER OF IT.

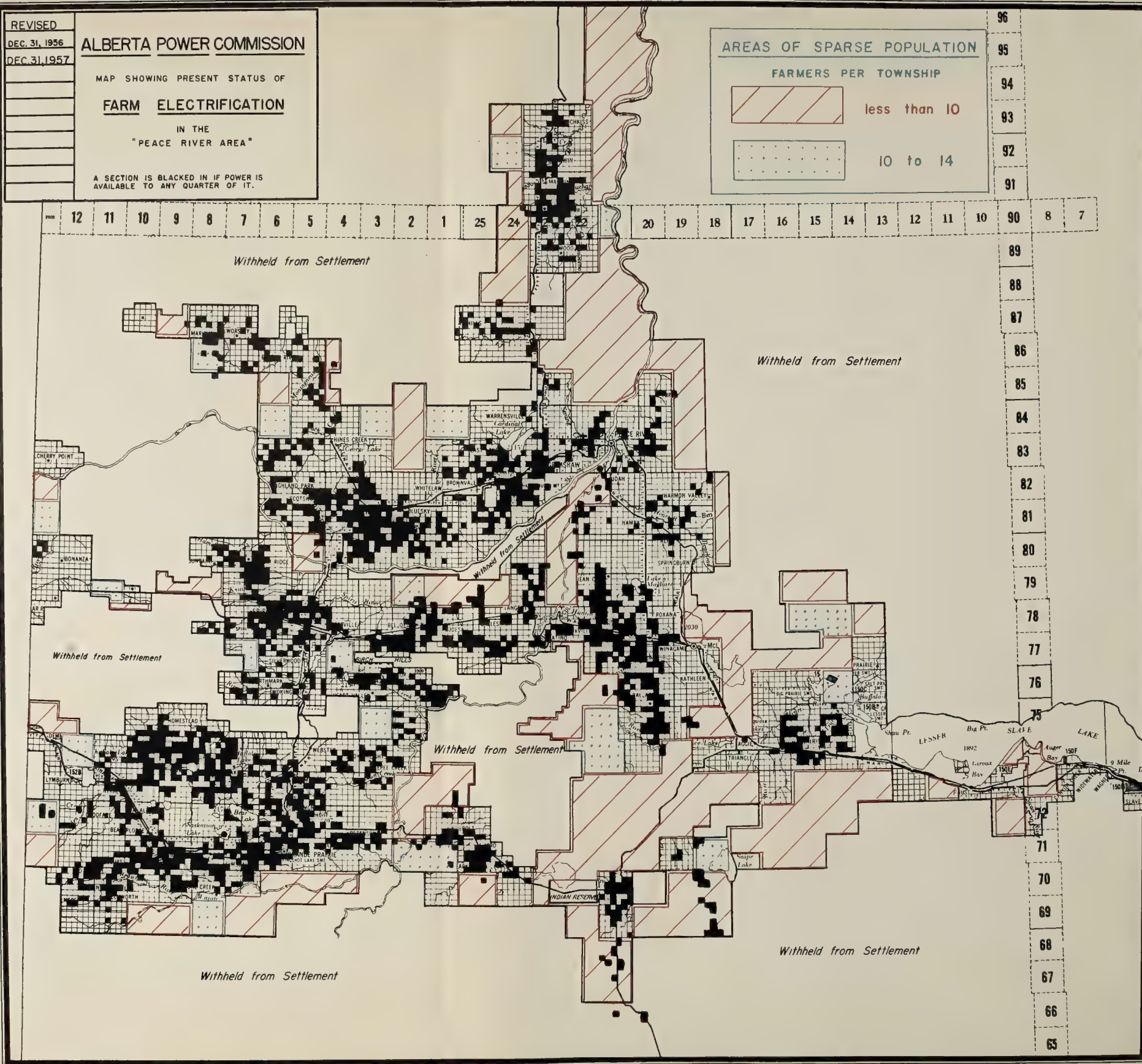


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1953 Session of the Legislature, has been of great assistance to all farmers who have been connected during the past three years. By the end of 1957 the Power Commission had given approval to 1,322 applications for loans under Part I of this Act. While all of this money had not been borrowed by the end of December, the approvals covered 19,954 farmers at an estimated cost of nearly \$23,000,000.00.

During 1957 the Power Commission gave approval to 364 applications for loans under Part I of the Revolving Fund Act for an amount of \$4,757,087.00, to give service to 3,891 farms. Of this amount \$3,301,062.00 was loaned where no Part II loan was necessary. Of the 3,891 farmers signing contracts under the Revolving Fund Act, 1,157 of them were in areas that needed the assistance of Part II loans. In such areas Part I loans totalling \$1,456,025.00 were approved in conjunction with Part II loans totalling \$541,505.00. The framework of lines in these Part II areas will make it possible for an additional 1,902 farmers to connect to them whenever they are ready. The following table shows the position of Part II loans at the end of December, 1957, and covers all loans from the beginning.

Standing of Part II Loans to December 31, 1957

Amount of Part I loans approved in conjunction with Part II loans since inception of Part II -	\$2,831,524.00
Amount of Part II loans as ini- tially approved -	1,100,797.00
Cancelled because more farms hooked up after construction started and therefore the loan was not needed -	35,860.00
	<hr/>
Total subject to call -	1,064,937.00
Drawn prior to Dec., 1957 -	\$ 827,993.00
	<hr/>
Refunded prior to Dec. 31, 1957 -	74,843.00
	<hr/>
Total part of that actually drawn which is still outstanding -	753,150.00
Amount of money authorized but not yet drawn from Treasurer -	236,944.00
Total number of farmers in areas having Part II loans -	6,011
Number of farmers taking service -	2,247

During the period since the inception of Part II loans the Power Commission has approved Part II loans totalling \$1,100,797.00. In some cases construction of the lines for which these loans were approved has not been started and in other cases has not advanced to the point where the money has to be paid out. For this reason, of the total amount authorized, \$236,944.00 has not yet been disbursed. Of the total of \$827,993.00 which was disbursed, \$74,832.00 has already been paid back because of farmers who have hooked up to the lines which were made possible by these loans.

The existence of Part II loans has made it possible to build a framework of lines in areas which otherwise could not have obtained service. There were

6,011 farmers in these areas and 2,247 of them took advantage of this financial assistance to get their lines built. When the remainder of the farmers in these areas take service it will be possible to pay off the outstanding balance of the Part II loans. Part II loans have made it possible to extend lines to many areas of the Province which otherwise could not have had service. There are very few areas left now which do not have a network of lines and for this reason we do not expect very heavy demands for Part II loans from here on.

Checking Costs

During the year the Commission has checked all the cost statements which the Companies send to R.E.A.'s showing the costs of building their lines. In addition to this, some field checks have been made on various farm areas. With very minor exceptions these costs have always been found to be correct. These checks further show that the areas have been constructed at cost. On the whole, then, we conclude that the Power Companies are building these areas at cost and that, from an engineering standpoint, they are building them efficiently.

The Power Commission feels that it is its duty, not only to investigate problems brought to it, but also to investigate any phases of farm electrification which it believes require study. While the building of farm lines appears very simple and the operation of them is taken for granted, nevertheless there are many intricate problems to be considered if we are to keep all expenses down to the very minimum. Many questions such as monthly versus quarterly billing, card meter reading, operating charge per foot of line; accumulation, investment and use of deposit reserves all merit careful and continuous study. As each of these problems is solved a new one arises to take its place. In its engineering and accounting aspects farm electrification is highly technical and the individual farmer does not have the time nor the opportunity to investigate these matters. The Power Commission feels that one of its main responsibilities is to see that

consideration is given to every factor that could possibly reduce the cost of electricity to the farmers. It tries to perform this service.

The question of the correctness of operating charges made to farmers is constantly under study. We believe that the Power Companies are doing a remarkable job of keeping these charges down and of accounting to the farmers for these charges. In most cases the charges are less than the monthly charges made to the farmer in his power bill, so that at the end of each year the Power Companies have been able to make a refund to the deposit reserves of the Associations. The operating charges made in Alberta appear to be reasonable and compare very favourably with those made by R.E.A.'s who are operating in similar territory in the United States. One of the advantages gained by the farmers which enables the operating charges to be kept low is the rather unique method of operating R.E.A.'s in Alberta. While in the United States the R.E.A.'s are generally larger than they are in Alberta, each R.E.A. maintains its own supervisory, office and operating staff, with the result that its overhead is apt to be high. In Alberta where the expenses of operating R.E.A. lines are pooled over all the farmers being served by any one power company, and where, for instance, Canadian Utilities Limited does the operating for some 10,000 farms, and Farm Electric Services does this work for some 29,000 farms, the overhead from a number of small offices is not added to operating expenses. In other words, these companies operate the farm lines more efficiently than would be the case if they were being operated separately by a number of small R.E.A.'s.

In the matter of deposit reserves the whole system of farm electrification in the Province has not been in operation long enough to come to a very definite conclusion on these matters, but the question is not being overlooked. In a preliminary study of this question of depreciation and deposit reserve accounts it appears that the deposit reserve being set aside at present by the different companies is approximately correct. At any rate, in the United States 1.08% of

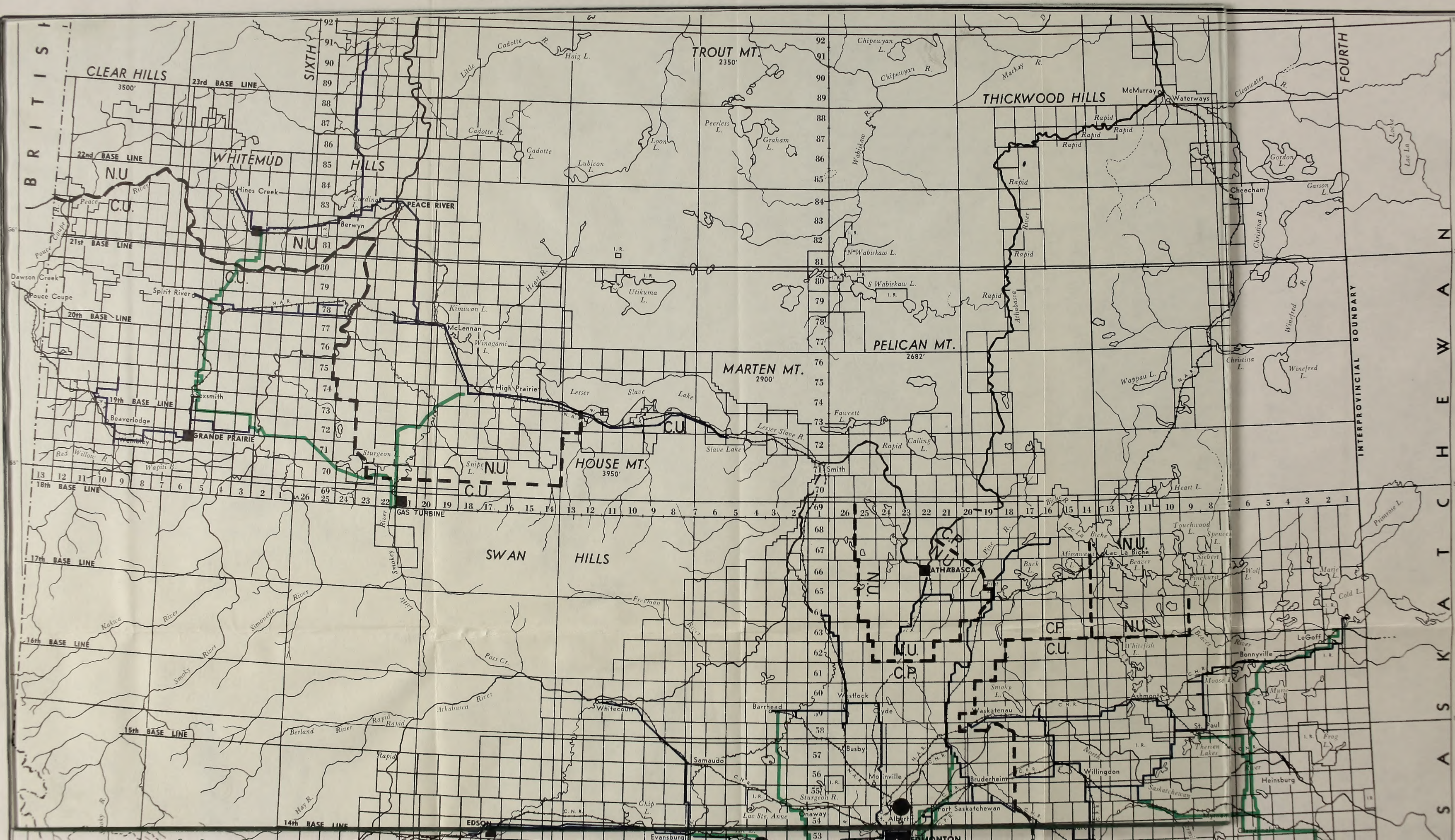
the total cost of the lines is set aside each year for depreciation. This was done after lengthy study on the part of the Rural Electrification Authority at Washington, and seems to be a fairly sound conclusion. The deposit reserves being set aside in Alberta are not too different from this. At the moment we are inclined to say that the present manner of setting aside reserves in Alberta should not be altered.

The annual use of electricity per farmer in the Province in 1957 has been 3,564 K.W.H. The K.W.H. used per farm per month is low when the farmer is first connected, but increases rapidly during the first year or so. The consumption of the 3,472 farmers who were connected in 1957 will be low. This will have the effect of making an average figure for K.W.H. per farm per year seem lower than it would actually be if all farmers had been connected for a period of, say, three years. When, therefore, we use this figure of 3,564 K.W.H. per farm per year, we should realize that the average farm that has been connected for three years, will use more than this.

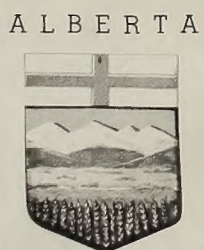
Nevertheless, when we consider this figure of 3,564 K.W.H. per farm per year, it is obvious that electricity has become a necessity in farming operations. It becomes all the more obvious that everything possible should be done to see that electricity is provided to at least 80% or 85% of our farmers as soon as possible. Electricity provides more than comfort and convenience. It is the most useful tool a farmer can have. It is the one tool which, if used correctly, will repay its cost to the farmer many times over. Electricity is not a luxury. In this age it is an economic necessity. Without it life on the farm is drudgery and undesirable. With it farm life becomes miraculously changed. An electrified farm is an ideal place in which to live. Agriculture is our largest industry. Everything should be done to make life on the farm as prosperous and as happy as possible. Electricity will be one of the biggest factors in bringing this about.

During 1957 the electricity consumed by farmers accounted for 6% of the total electricity sold in the Province. While farmers use only 6% of the K.W.H. they are responsible for about 13% of the peak load. Even when we get all the farms electrified the percentage which the farmers will use of the K.W.H. generated in the Province will not be large. By 1960 it may be 7% of the total output.

Since the farmers were responsible for about 13% of the peak load in the Province it means that 13% of the total capacity of the power plants and the transmission lines, or about 62,000 K.W., was reserved for their use. This 62,000 K.W. is a large proportion of total plant capacity and consequently means that a large proportion of the companies' investment in plants and transmission lines is reserved solely for farmers. The companies' investment in this equipment which is reserved solely for the farmers' use will be well over \$500 for each farm served.



ALBERTA
CANADA



ALBERTA POWER COMMISSION



ALBERTA



PROVINCE OF ALBERTA CANADA

ALBERTA POWER COMMISSION
MAP OF
TRANSMISSION LINES
IN
PROVINCE OF ALBERTA

19 20 40 60 57

Scale: 1 Inch = 20 Miles

LEGEND

TRANSMISSION LINES 132 K.V. & OVER	---	CALGARY POWER CO.	---	C.P.
" " 33 K.V. TO 72 K.V.	---	CANADIAN UTILITIES LTD.	---	C.U.
" " UNDER 33 K.V.	---	NORTHLAND UTILITIES LTD.	---	N.U.
BOUNDARY BETWEEN COMPANIES	---	EAST KOOTENAY POWER CO.	---	E.K.P.
POWER PLANTS - STEAM	●	POWER PLANTS - HYDRO	▲	
POWER PLANTS - INTERNAL COMBUSTION	■			

